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## Abstract

Collect Earth Online (CEO) is a free and open online implementation of the FAO Collect Earth system for collaboratively collecting environmental data through the visual interpretation of Earth observation imagery. The primary collection mechanism in CEO is human interpretation of land surface characteristics in imagery served via Web Map Services (WMS). However, interpreters may not have enough contextual information to classify samples by only viewing the imagery served via WMS, be they high resolution or otherwise. To assist in the interpretation and collection processes in CEO, SERVIR, a joint NASA-USAID initiative that brings Earth observations to improve environmental decision making in developing countries, developed the GeoDash system, an embedded and critical component of CEO. GeoDash leverages Google Earth Engine (GEE) by allowing users to set up custom browser-based widgets that pull from GEE's massive public data catalog. These widgets

can be quick looks of other satellite imagery, time series graphs of environmental variables, and statistics panels of the same. Users can customize widgets with any of GEE's image collections, such as the historical Landsat collection with data available since the 1970s, select date ranges, image stretch parameters, graph characteristics, and create custom layouts, all on-the-fly to support plot interpretation in CEO. This presentation focuses on the implementation and potential applications, including the back-end links to GEE and the user interface with custom widget building. GeoDash takes large data volumes and condenses them into meaningful, relevant information for interpreters. While designed initially with national and global forest resource assessments in mind, the system will complement disaster assessments, agriculture management, project monitoring and evaluation, and more.

## Methodology

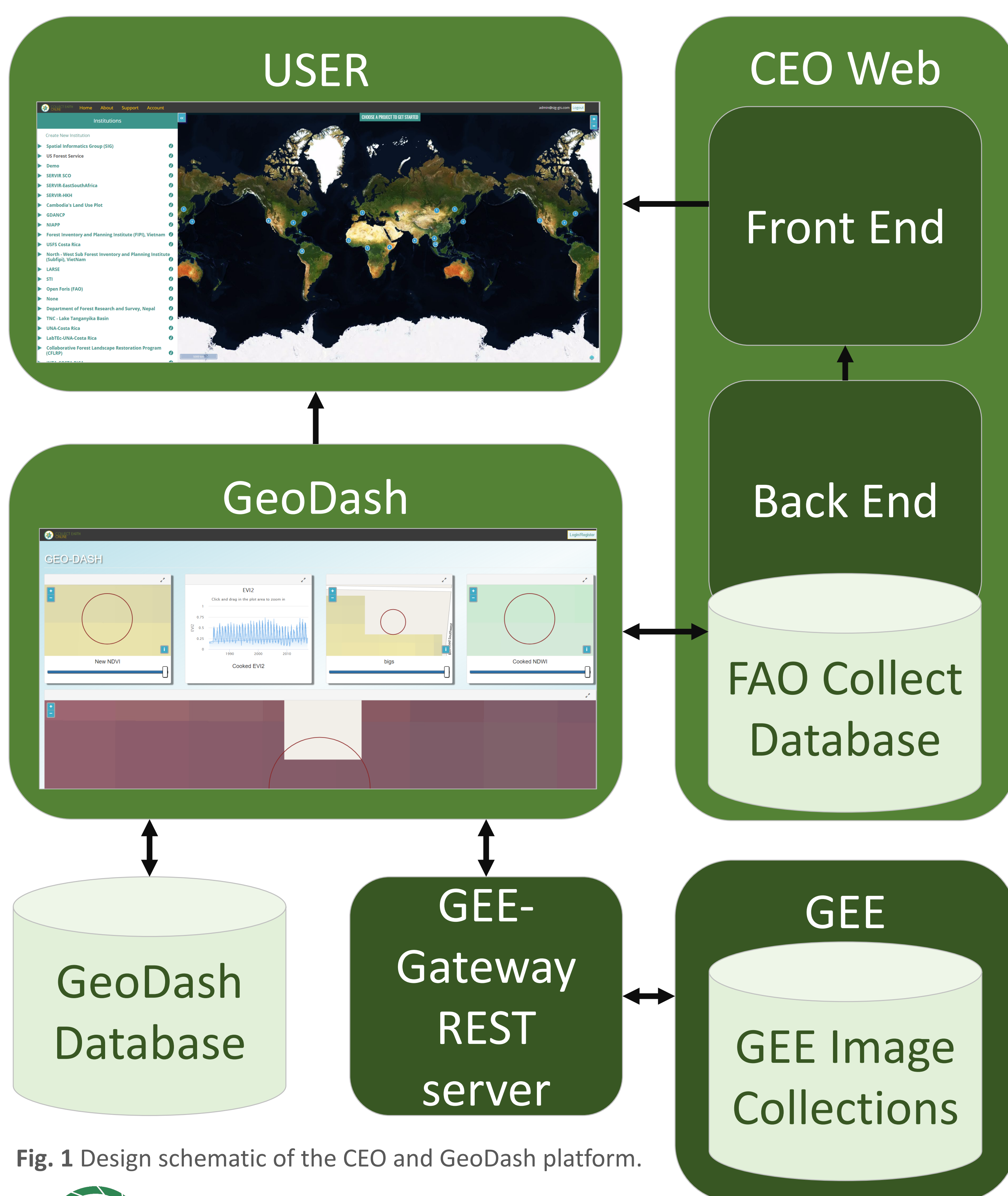


Fig. 1 Design schematic of the CEO and GeoDash platform.

## Results

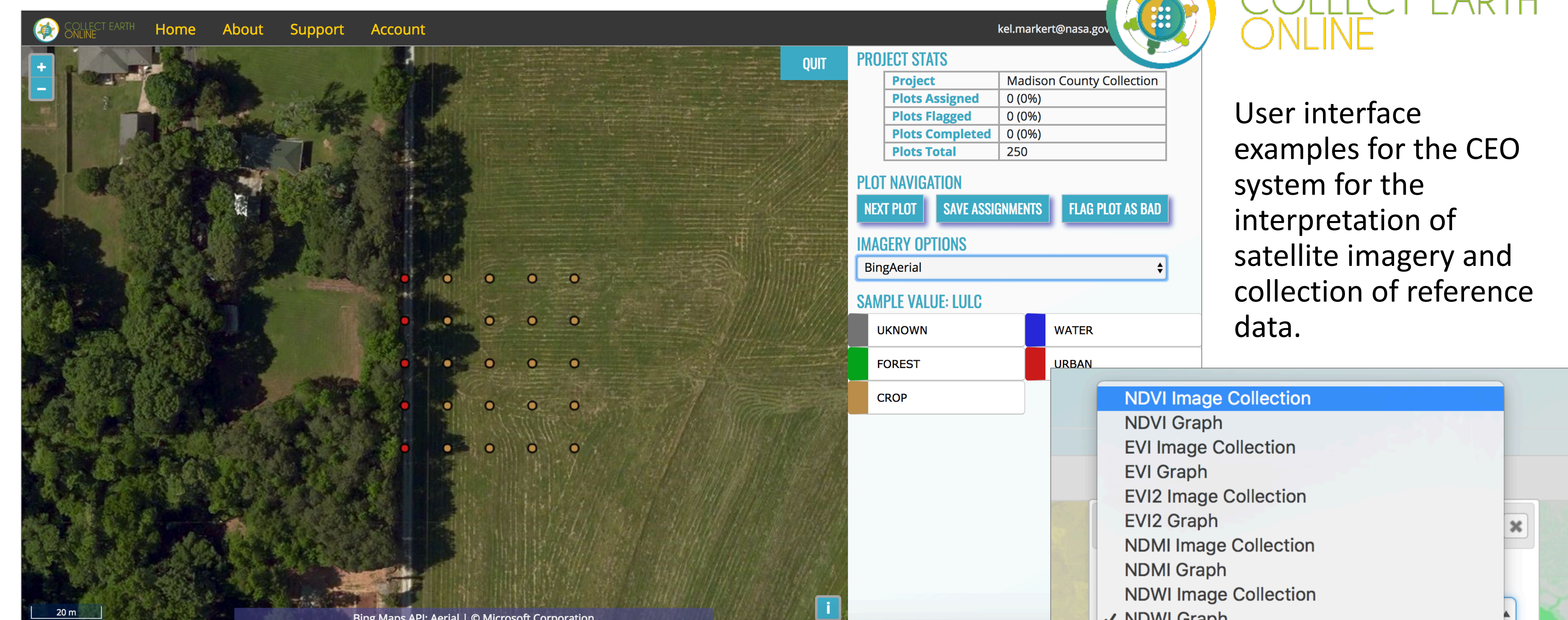


Fig. 2 Example of the CEO Collection Page for users to assign land cover types to sub-plot samples.

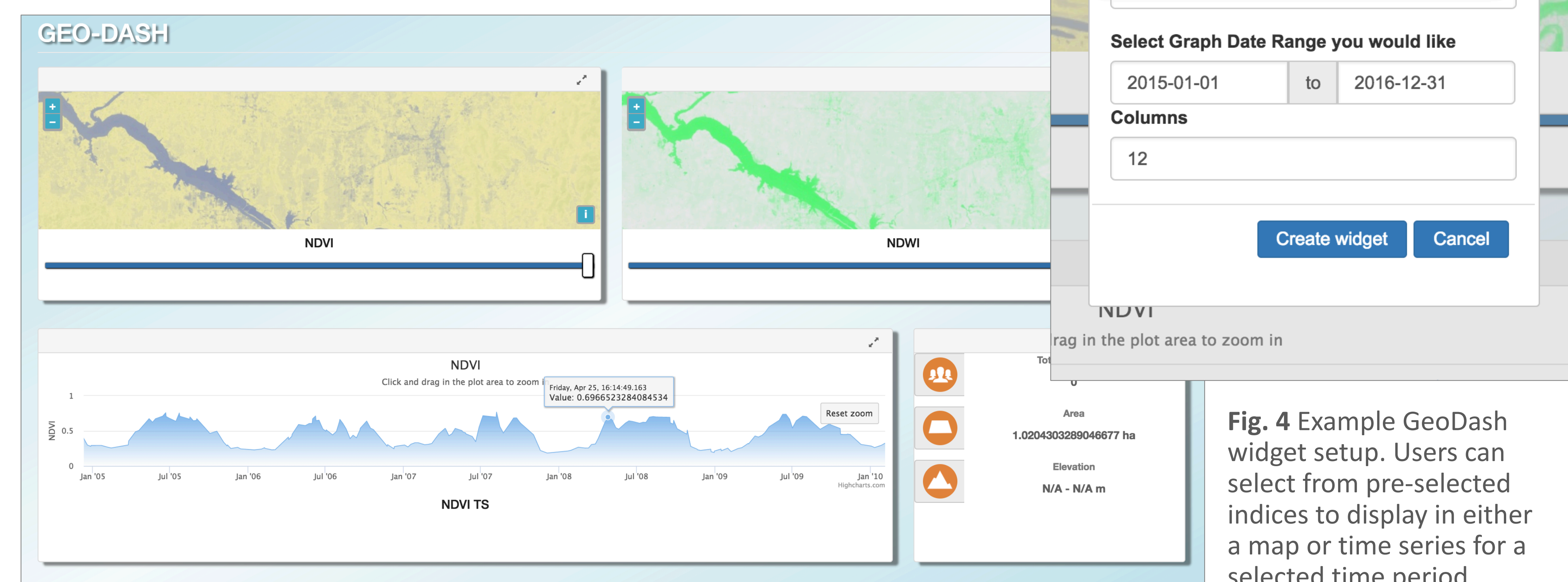


Fig. 3 Example of the GeoDash Page for users to assess additional information gleaned from Landsat. Index values in maps or time series to be viewed to identify, for example, seasonality.

Collect Earth Online promotes consistency in locating, interpreting, and labeling reference data plots for use in classifying and monitoring land cover / land use change. The full functionality of Collect Earth Online including collaborative compilation of reference point databases, using the FAO collect system, is implemented online so there is no need for desktop installation. The GeoDash system is integrated into CEO where collection plots are inputs into the GEE queries for display. The GeoDash system being separate allows for building custom widgets the leverage Earth Engine for additional applications such as forest monitoring.

## Conclusions

- ▶ CEO facilitates collaboratively collecting reference data within a free and open online system.
- ▶ GeoDash is a flexible system that leverages GEE for custom widget creation to access and view petabytes of data in meaningful information.

- ▶ This system enables the collection of more information within the CEO systems by allowing users to view data relevant to identifying land cover types.
- ▶ The exploration for use of CEO and GeoDash for other application such as identification of surface water is on going and will continued to be pursued.

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## Project Partners



COLLECT EARTH ONLINE  
User interface examples for the CEO system for the interpretation of satellite imagery and collection of reference data.

Fig. 4 Example GeoDash widget setup. Users can select from pre-selected indices to display in either a map or time series for a selected time period

## Contact

Questions?  
About Project – kel.markert@nasa.gov  
About SERVIR – servirglobal.net  
About CEO – ceo.sig-gis.com  
About OpenForis – openforis.org

Code repositories -  
- github.com/openforis/collect-earth-online  
- github.com/openforis/gee-gateway